UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/637,640	08/14/2000	Shigeki Watanabe	837.1956/JDH	9874

21171 7590 02/28/2003

STAAS & HALSEY LLP
700 11TH STREET, NW
SUITE 500
WASHINGTON, DC 20001

EXAMINER	
WONG, ERIC K	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claim group I (Claime 1-10 and 15-27) in Paper No. 3 is acknowledged.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4, 5, 6, 7, 8, 15, 16, 22, 23, and 25 are rejected under 35 U.S.C. 103(a) as being anticipated by Saito et. al. as described in "Prechirp Technique for Dispersion Compensation for a High-Speed Long-Span Transmission" (IEEE Photonics Technology Letters, Vol. 3, No. 1, January 1991).

Saito discloses a technique utilizing an optical fiber that is compressed, amplified and sent to an optical device (Figure 1). It is inherent that an optical fiber of Saito has dispersion as mentioned in claim 1 section a. Saito fails to explicitly state that the optical fiber is connected to a device that has saturated gain. However, Saito discloses amplifier repeaters connected to the optical fiber. As to claim 2, and 16, it is inherent in long haul communications to attach multiple devices with optical fiber to a primary device to maintain a signal through long distances such as a repeater. Such amplifiers would inherently have saturated gain in long haul transmission of a compressed signal.

Prechirping a signal as described by Saito, is an effective technique for dispersion compensation. This dispersion may be normal, as well as anamolous, and the "prechirped optical waveform consists of lower frequency components on the front of the pulse and higher frequency components on the tail of the pulse, by adjusting amplitude and phase..." (Column 1, Lines 44-48).

This technique can be used along an optical fiber as a dispersion compensator as claimed in clams 7, 8, 24, and 25.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art of optical communications to use the repeaters disclosed by Saito as a device with saturated gain to transmit a compressed signal over long distances.

3. Claims 9, 10, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito as applied to Claims 1 and 15 above, in further view of United States Patent Number 5,777,770 to Naito et. al.

As to claims 9, 10 and 26, Saito fails to explicitly disclose the step of providing an optical phase conjugator where the dispersion of the first optical fiber is substantially equally divided.

Naito discloses the step of adding an amplifier and optical phase conjugators where dispersion is equally divided as depicted in Figure 36 and 37 to Saito's technique in order to provide a efficient long-haul communications of an optical signal.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art of optical communications to add a second device to a first fiber,

whereby employing the use of conjugators and amplifiers that would provide an optical communication system for a very long distance.

4. Claims 3, 17, 18, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito as applied to Claims 1 and 15 above, and further in view of United States Patent Number 6,236,498 to Freeman and in further view of Lowry et. al.

Saito discloses an optical transmission system that uses optical amplifiers with repeaters, but fails to explicitly describe the type of amplifier used.

Freeman teaches a gain flattening optical filter. By using a gain shaping optical amplifier, one can adjust gain as needed for saturation as in Figures 5, 5A, and 7 and Column 5, Line 60 as applied in Claims 3 and 21.

As to Claim 17 and 18, Lowry teaches of a semiconductor optical amplifier (SOA) that uses a laser as a light source for supplying assist light to apply a clamped signal gain to a specified saturated gain level. Because this amplifier relies on standard technology, it can be incorporated into many different types of photonic integrated circuits (Pages 18 and 19 of Reference U).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art of long haul optical communications to use the optical amplifier by Freeman to successfully gain shape a saturated signal so that long haul transmission of signals will not be degraded and provide a optical fiber for signal and to use a SOA as taught by Lowry to provide an amplifier that is inexpensive, small and gain adjustable for optical signal transmission.

5. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito as applied to Claim 15 above, and further in view of United States Patent Number 5,184,247 to Schimpe.

Saito discloses an optical transmission system that uses optical devices connected to a first fiber, but fails to explicitly describe the type of device as a distributed feedback (DFB) laser with a light assist source.

Schimpe teaches an optically stabilized feedback laser which is composed of a DFB laser and a beamed-in wavelength (Abstract). This device provides maximum gain or saturation of a wavelength (Figure 2). This DFB laser setup can apply a gain saturated in concert with an increase in input power to the optical signal.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art of long haul optical communications to use the DFB laser and pump with assist light by Schimpe to successfully gain shape a saturated signal so that long haul transmission of signals will not be degrade.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. United States Patent Number 5,499,134 to Galvanauskas et. al. for optical pulse amplification using chirped bragg gratings.

b. United States Patent Number 6,108,474 to Eggleton et. al. for an optical pulse compressor for optical communications systems.

c. United States Patent Number 5,522,004 to Djupsjobacka et. al. for a dispersion compensating device in a fiber optic transmission system.

d. United States Patent Number 5,271,024 to Huber for an optical amplifier and laser with gain flattening capabilities.

e. United States Patent Number 6,356,383 to Cornwell, Jr. et. al. for an optical transmission system which includes optical amplifier apparatuses and methods.

f. United States Patent Number 5,566,197 to Nillsson for a tunable DFB laser with assist light.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Wong whose telephone number is 703-305-4741. The examiner can normally be reached on Monday through Friday, 830AM - 430PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 703-308-4819. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0725 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

EKW
February 22, 2003

HEMANG SANGHAVI
PRIMARY EXAMINER